

- i) an interface plug connected to the catheter plug to establish electrical connection to each of the electrodes,
    - ii) a voltage acquisition apparatus in communication with the interface plug and coupled to said array of acquisition electrodes, said voltage acquisition apparatus having an analog to digital converter for digitizing voltages on said array of acquisition electrodes, and
    - iii) a signal generator in communication with one or more of said array of voltage acquisition electrodes for generating low current pulses; and
  - c) a computer having;
    - i) electrical communication with the signal generator of the interface apparatus to control its function,
    - ii) electrical communication with the voltage acquisition apparatus to receive the voltages acquired by the signal acquisition electrodes,
    - iii) processing unit to compute a three-dimensional volumetric electric field distribution based on the voltages received from the signal acquisition electrodes, and
    - iv) a display showing the computed field distribution.
2. The endocardial chamber mapping system of claim 1, wherein the computer further comprises:
- v) means for obtaining data relating to volume and shape of the endocardial chamber through the generation of low current pulses by the signal generator and for creating an image of said volume and shape,
- and wherein the display shows the computed field distribution displayed on the image of the volume and shape of the endocardial chamber.
3. The endocardial chamber mapping system of claim 2, wherein the display shows the computed field distribution in a continuously filled color-scale map shown over the volume and shape of the endocardial chamber.